LONDON-WEST MIDLANDS ENVIRONMENTAL STATEMENT

Volume 5 | Technical Appendices

CFA14 | Newton Purcell to Brackley

Construction assessment (SV-003-014)

Sound, noise and vibration

November 2013

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Department for Transport

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1 Introduction

1.1.1 The sound, noise and vibration appendices comprise four sections. The first of these is an introduction to the relevant policy and methodology (Volume 5: Appendix SV-001-000). This relates to the sound, noise and vibration assessment for all community forum areas (CFA).

1.1.2 For the Newton Purcell to Brackley community forum area (CFA 14), the other three sections are as follows:

- baseline sound, noise and vibration (Volume 5: Appendix SV-002-014);
- construction sound, noise and vibration (Volume 5: Appendix SV-003-014) (this appendix); and
- operational sound, noise and vibration (Volume 5: Appendix SV-004-014).

1.1.3 The outcomes of the assessment are summarised in Volume 2: CFA Report 14, Newton Purcell to Brackley (CFA Report 14), Section 11.

1.1.4 Maps referred to throughout the sound, noise and vibration appendices are contained in the Volume 5, Sound, Noise and Vibration Map Book.

1.1.5 This appendix presents the likely noise and vibration impacts, effects and significant effects arising from the construction of the Proposed Scheme for the Newton Purcell to Brackley area on:

- people, primarily where they live ('residential receptors') in terms of:
  - individual dwellings;
  - on a wider community basis, including any shared community open areas; and
- community facilities such as schools, hospitals, places of worship, and also commercial properties such as offices and hotels, collectively described as 'non-residential receptors' and 'quiet areas'.

1.1.6 The assessment of likely impacts, effects and significant effects from construction noise and vibration on agricultural, community, ecological or heritage receptors and the assessment of tranquillity are presented in the following documents within Volume 5:

- Agriculture, forestry and soils — Appendix AG-001-014
- Community — Appendix CM-001-014
- Ecology — Appendix EC-005-014
- Heritage — Appendix CH-003-014
- Landscape and Visual — Appendix LV-001-014

1.2 Evaluation of impacts and effects

1.2.1 This appendix provides a quantitative assessment of construction noise and vibration impacts/effects and a qualitative assessment of likely significant effects, based on the impacts/effects identified and other local context information consistent with the scope and methodology defined for the Proposed Scheme.

1.2.2 Indirect effects arising from temporary changes in traffic patterns on the existing road network as a consequence of constructing the Proposed Scheme are also reported in this appendix, where they will occur within the study area (as defined in Volume 5: Appendix SV-001-000).

1.2.3 In undertaking the assessment of sound and vibration, consistent with Environmental Impact Assessment (EIA) Regulations and emerging National Planning Practice Guidance[1] a differentiation between impacts effects, adverse effects and significant effects is made. Further information is provided in Volume 5: Appendix SV-001-000.

1.2.4 The assessment of impacts and effects has been undertaken at assessment locations that are representative of a number of dwellings or other sensitive receptors. The assessment locations employed in this assessment are presented in the SV-03 Map Series (Volume 5, Sound, Noise and Vibration Map Book).

[1] Information is provided in the Department for Communities and Local Government's emerging National Planning Practice Guidance – Noise http://planningguidance.planningportal.gov.uk, (refer to the noise exposure hierarchy), as available on 14th October 2013.

2 Scope, assumptions and limitations

2.1 Regional and local policy guidance

2.1.1 The policy framework for sound, noise and vibration is set out in Volume 1 and in Volume 5: Appendix SV-001-000. As part of the engagement with local authorities through the Planning Forum Sub Group - Acoustics, information regarding any specific local planning guidance in respect of noise and vibration has been requested. Whilst no information has been received for this study area via the Planning Forum Sub Group - Acoustics, the following local policy guidance on noise and vibration has been identified:

- The South Northamptonshire Local Plan 1997;
- The Aylesbury Vale District Local Plan January 2004; and
- The Cherwell Local Plan 1996.

2.1.2 This guidance has been considered as part of formulating the detailed application of the impact and significance criteria set out in Volume 5: Appendix SV-001-000.

2.2 Engagement

2.2.1 Details of engagement on a route-wide basis with the local and county authorities' Environmental Health Practitioners via the Planning Forum Sub Group - Acoustics, is set out in Volume 1.

2.2.2 Engagement with communities has been via the Community Forums, as set out in Volume 1. In respect of sound, noise and vibration the following discussions have taken place:

- general discussions in respect of local issues, including possible ways to avoid and mitigate the potential impacts of noise or vibration;
- September / October 2012: a specific presentation about sound, noise and vibration with discussion afterwards with one of the project team specialists;
- November / December 2012: specific request for the Community Forum regarding baseline sound monitoring locations;
- January / February 2013: feedback to the Community Forum on any proposed baseline monitoring locations; and
- verbal / written responses to questions and sound, noise and vibration.

2.3 Methodology

2.3.1 The methodology used for the assessment of airborne sound, ground-borne sound and vibration impacts and the determination of significant effects is defined in the Scope and Methodology Report (SMR) (Volume 5: Appendix CT-001-000/1). Further clarification regarding specific areas is presented in the SMR addendum (Volume 5:

Appendix CT-001-000/2). Further information is contained in Volume 5: Appendix SV-001-000.

2.4 Assumptions

2.4.1 Route-wide assumptions are outlined in Volume 1 and are further detailed in Volume 5: Appendix SV-001-000. Local assumptions that apply to the assessment of construction sound noise and vibration within this area are set out in Volume 2: CFA Report 14.

2.5 Limitations

2.5.1 The route-wide limitations and the approach adopted to assure that they will not impact the robust assessment of sound, noise and vibration are presented in Volume 5: Appendix SV-001-000. No specific additional limitations are identified for this study area.

3 Environmental baseline

3.1 Existing baseline

3.1.1 Baseline sound level data has been collected at locations representative of the airborne sound-sensitive receptors. The existing and future baseline airborne sound levels derived from these measurements are given in Volume 5: Appendix SV-002-014. Details of the baseline data collection and the methodology are given in Volume 5: Appendix SV-001-000 and specifically for this study area in Volume 5: Appendix SV-002-014.

3.2 Future baseline

3.2.1 The assessment of noise from construction activities assumes a baseline year of 2017 which represents the period immediately prior to the start of the construction period. As a reasonable worst case, it has been assumed that no change in baseline sound levels will occur between the existing baseline (2012/13) and the future baseline year of 2017. The assessment of noise from construction traffic assumes a baseline year of 2021, representative of the middle of the construction period when the construction traffic flows are expected to be at their peak. Further information can be found in the Traffic and Transport assessment (Volume 5: Appendix TR-001-000).

4 Effects arising during construction

4.1 Introduction

4.1.1 The assessment is reported first for ground-borne sound and vibration and then for airborne sound. Under each of these headings, the results of the quantitative identification of impacts and effects are presented. This is followed by the identification of significant effects and the evidence used to support these conclusions.

4.1.2 The structure of this assessment report is as follows:

- Avoidance and mitigation measures
- Quantitative identification of impact and effects
  - Ground-borne sound and vibration
    - residential
    - non-residential
  - Airborne sound
    - residential
    - non-residential
- Assessment of impacts and effects
  - residential receptors: direct effects – dwellings
  - residential receptors: direct effects – communities
  - residential receptors: indirect effects
  - non-residential receptors: direct effects
  - non-residential receptors: indirect effects
  - cumulative effects from the Proposed Scheme and other committed development

4.2 Avoidance and mitigation measures

4.2.1 These measures are set out in Volume 2: CFA Report 14.

4.3 Quantitative identification of impacts and effects

Ground-borne vibration

4.3.1 Assessment locations defined for the quantitative assessment of impacts are shown in the SV-03 Map Series (Volume 5, Sound, Noise and Vibration Map Book).

4.3.2 For each assessment location, the assessment results for residential receptors are presented in Table 1. No assessment results are provided for non-residential receptors as no vibration generating construction activities have been identified in close proximity to non-residential receptors. Explanation of the information in Table 1 is provided in Volume 5: Appendix SV-001-000, with the following additional notes:

	Where the significant effect column is highlighted, then a significant effect is identified at the referenced community, or individual receptor.
*	Significant effect – the quantitative impact methodology has identified either: 1) no impact at this receptor but further information (see assessment) has identified that a significant effect is nonetheless likely; or 2) an impact at this receptor which, based upon further qualitative receptor information, (see assessment text) does not gives rise to a significant effect.
~	Significant effect – impacted dwellings which are either spatially remote from larger defined residential areas, or a small number of dwellings whose impact is not considered to represent the larger defined residential area, and as such are not considered to be part of a community significant effect.
A	Type of effect – adverse effect
S	Type of effect – significant adverse effect
NA	Type of effect – not generally an adverse effect
B	Type of effect – for non-residential receptors further detail about the type of effect is set out in the text of Volume 5: Appendix SV-001-000
R	Type of receptor - residential
V1	Type of receptor: (V1) vibration sensitive research and manufacturing, hospital, and university equipment; (V2) hotels, hospital wards and education dormitories; (V3) offices, schools and places of worship; or (V4) workshops.
T	Receptor design – typical
S	Receptor design – special

Table 1: Assessment of construction induced ground-borne vibration at residential receptors

Assessment location		Impact criteria				Significance criteria									
ID	**Area represented**	**Peak particle velocity (PPV) [mm/s] on foundation**	**Typical/highest monthly indoor vibration dose value (VDV) [m/s$^{1.75}$]**		**Construction activity resulting in highest forecast vibration levels**	**Type of effect**	**Number of impacts represented**	**Type of receptor**	**Receptor design**	**Existing environment**	**Unique feature**	**Combined impact**	**Impact duration [m]**	**Mitigation effect**	**Significant effect**
			Day (0700-2300)	**Night (2300-0700)**											
277261	Newton Purcell, Buckingham	0.14	0.07/0.07	-	Barton to Mixbury cutting - railtrack formation and sub-ballast - medium roller	NA	2	R	T		-	-	1	-	
277496	Banbury Road, Finmere	0.45	0.2/0.2	-	Barton to Mixbury cutting - railtrack formation and sub-ballast - medium roller	NA	1	R	T		-	Y	1	-	~

Airborne sound: direct impacts and effects

4.3.3 Activities associated with the construction phases of the Proposed Scheme will generate airborne noise. The assessment of the likely impacts and significant effects as a result of the construction noise has considered the effects on:

- residential receptors, both as individual dwellings and communities; and
- non-residential receptors, including quiet areas.

4.3.4 Volume 2: CFA Report 14 makes reference to any major construction activity during the evening and at night but the assessment has also considered the minor essential activities that will have to operate on a 24/7 basis for reasons of safety and engineering practicability (e.g. water pumps).

4.3.5 For each type of receptor, subject to the screening distances identified, and based upon supplied plant information from engineers, the typical and highest monthly $L_{pAeq,T}$ noise levels from construction activities have been calculated at the façade of all assessment locations, which are representative of a number of receptors in the study area.

4.3.6 The assessment results, impact criteria and significance criteria for the assessment of the Proposed Scheme at residential and non-residential receptors are presented in Table 2 and Table 3 respectively.

4.3.7 The construction activity resulting in highest forecast noise levels is reported in Table 2 and Table 3 for each assessment location and time period, where the highest forecast noise level from any individual construction activity is above 40dB $L_{pAeq,T}$ during the daytime and evening periods and 35dB $L_{pAeq,T}$ during the night-time. Where the highest forecast noise level from any individual construction activity is less than 40dB $L_{pAeq,T}$ during the daytime and evening or 35dB $L_{pAeq,T}$ during the night-time no activities have been reported.

4.3.8 Explanation of the information within Table 2 and Table 3 is provided in Volume 5: Appendix SV-001-000, with the following additional notes:

	Where the significant effect column is highlighted, then a significant effect is identified at the referenced community, or individual non-residential receptor
*	Significant effect – the quantitative impact methodology has identified either: 1) no impact at this receptor but further information (see assessment) has identified that a significant effect is nonetheless likely; or 2) an impact at this receptor which, based upon further qualitative receptor information, (see assessment text) does not gives rise to a significant effect.
~	Significant effect - impacted dwellings which are either spatially remote from larger defined residential areas, or a small number of dwellings whose impact is not considered to represent the larger defined residential area, and as such are not considered to be part of a community significant effect.
A	Type of effect – adverse effect

S	Type of effect – significant adverse effect
NA	Type of effect – not generally an adverse effect
B	Type of effect – for non-residential receptors further detail about the type of effect is set out in the text of Volume 5: Appendix SV-001-000
R	Type of receptor - residential
G	Type of receptor:
	(G1) theatres, large auditoria and concert halls;
	(G2) sound recording and broadcast studios;
	(G3) places of meeting for religious worship, courts, cinemas, lecture theatres, museums and small auditoria or halls;
	(G4) schools, colleges, hospitals, hotels and libraries; or
	(G5) offices and general commercial premises.
T	Receptor design – typical
S	Receptor design - special
H	Existing environment – high existing ambient noise levels: daytime level more than 75dB, evening-time level more than 65dB or night-time level more than 55dB L_{pAeq} at the façade.
NI	Mitigation effect - identified as likely to qualify for noise insulation under the draft Construction Code of Practice (draft CoCP).
D,E,N	Impact duration (months) – duration of impact during the day (D), evening (E) or night (N).

Table 2: Assessment of construction noise at residential receptors

Assessment location		Impact criteria				Significance criteria									
ID	Area represented	Typical/highest monthly outdoor L_{pAeq} [dB] at the façade			Construction activity resulting in highest forecast noise levels	Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Impact duration [months]	Mitigation effect	Significant effect
		Day 0700-1900	Evening 1900-2300	Night 2300-0700											
266177	John Clare Close, Brackley	46/49 [A]	<40/<40 [C]	-	Day: haul route movements - to and from road.	NA	26	R	T	H	-	-	-	-	
266596	Radstone, Brackley	43/54 [A]	<40/<40 [A]	-	Day: public footpath AX15 overbridge – substructure construction.	NA	1	R	T	-	-	-	-	-	
266631	Radstone, Brackley	51/57 [A]	47/49 [B]	-	Day: public footpath AX15 overbridge – substructure construction; and Evening: Brackley culvert - drainage and culvert works.	NA	1	R	T	-	-	-	-	-	
267247	South Bank, Turweston	43/51 [A]	-	-	Day: Turweston cutting – cutting excavation.	NA	8	R	T	-	-	-	-	-	
268637	Main Street, Turweston	44/51 [A]	-	-	Day: haul route movements - on site.	NA	2	R	T	-	-	-	-	-	
268683	Chapel Lane, Turweston	44/50 [A]	-	-	Day: Turweston cutting – cutting excavation.	NA	12	R	T	-	-	-	-	-	
270056	Turweston, Brackley	48/55 [A]	-	-	Day: Turweston viaduct – substructure .construction	NA	3	R	T	H	-	-	-	-	
270079	Northampton Road, Brackley	51/55 [A]	<40/<40 [C]	-	Day: haul route movements - to and from road.	NA	2	R	T	H	-	-	-	-	
270561	Radstone,	45/53	<40/<40	-	Day: public bridleway AX18 and public footpath	NA	1	R	T	-	-	-	-	-	

Assessment location		Impact criteria				Significance criteria									
ID	Area represented	Typical/highest monthly outdoor L_{pAeq} [dB] at the façade			Construction activity resulting in highest forecast noise levels	Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Impact duration [months]	Mitigation effect	Significant effect
		Day 0700-1900	Evening 1900-2300	Night 2300-0700											
	Brackley	[A]	[A]		AX5 overbridge - substructure construction.										
273397	Radstone, Brackley	46/56 [A]	<40/<40 [A]	-	Day: public bridleway AX18 and public footpath AX5 overbridge - substructure construction.	NA	3	R	T	-	-	-	-	-	
273418	Radstone, Brackley	46/54 [B]	<40/<40 [>C]	-	Day: public bridleway AX18 and public footpath AX5 overbridge - substructure construction.	NA	1	R	T	H	-	-	-	-	
273468	Radstone, Brackley	49/58 [A]	44/46 [A]	-	Day: Radstone Road overbridge and footpath AX7 diversion - substructure construction; and Evening: Brackley culvert - drainage and culvert works.	NA	1	R	T	-	-	-	-	-	
273513	Radstone, Brackley	44/52 [A]	43/45 [A]	-	Day: haul route movements - on site; and Evening: Brackley culvert - drainage and culvert works.	NA	3	R	T	-	-	-	-	-	
273532	Radstone, Brackley	46/54 [A]	43/45 [A]	-	Day: Radstone Road overbridge and footpath AX7 diversion - substructure construction; and Evening: Brackley culvert - drainage and culvert works.	NA	1	R	T	-	-	-	-	-	
273535	Radstone, Brackley	45/53 [A]	43/45 [B]	-	Day: Radstone Road overbridge and footpath AX7 diversion - substructure construction; and Evening: Brackley culvert - drainage and culvert works.	NA	1	R	T	-	-	-	-	-	
273549	Radstone,	43/51	42/44	-	Day: Radstone Road overbridge and footpath AX7 diversion - Finishes; and	NA	2	R	T	-	-	-	-	-	

Assessment location		Impact criteria				Significance criteria									
ID	Area represented	Typical/highest monthly outdoor L_{pAeq} [dB] at the façade			Construction activity resulting in highest forecast noise levels	Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Impact duration [months]	Mitigation effect	Significant effect
		Day 0700-1900	Evening 1900-2300	Night 2300-0700											
	Brackley	[A]	[B]		Evening: Brackley Culvert - drainage and culvert works.										
273561	Radstone, Brackley	45/54 [A]	43/45 [B]	-	Day: Radstone Road overbridge and footpath AX7 diversion - substructure construction; and Evening: Brackley culvert - drainage and culvert works.	NA	6	R	T	-	-	-	-	-	
273586	Radstone, Brackley	<40/47 [A]	<40/<40 [A]	-	Day: public footpath AX15 overbridge - substructure construction.	NA	1	R	T	-	-	-	-	-	
275510	Church Lane, Mixbury	47/54 [A]	-	-	Day: haul route movements - on site.	NA	1	R	T	-	-	-	-	-	
275606	Banbury Road, Finmere	41/49 [A]	-	-	Day: haul route movements - on site.	NA	1	R	T	H	-	-	-	-	
275991	Mixbury, Brackley	41/49 [A]	-	-	Day: haul route movements - on site.	NA	16	R	T	-	-	-	-	-	
276471	Church View, Mixbury	<40/47 [A]	-	-	Day: haul route movements - on site.	NA	12	R	T	-	-	-	-	-	
276513	Evenley Road, Mixbury	44/51 [A]	-	-	Day: haul route movements - on site.	NA	8	R	T	-	-	-	-	-	
276541	Church Lane, Mixbury	43/49 [A]	-	-	Day: haul route movements - on site.	NA	1	R	T	-	-	-	-	-	

Assessment location		Impact criteria				Significance criteria									
ID	Area represented	Typical/highest monthly outdoor L_{pAeq} [dB] at the façade			Construction activity resulting in highest forecast noise levels	Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Impact duration [months]	Mitigation effect	Significant effect
		Day 0700-1900	Evening 1900-2300	Night 2300-0700											
276587	Mixbury, Brackley	43/49 [A]	-	-	Day: haul route movements - on site.	NA	11	R	T	-	-	-	-	-	
276675	Mixbury, Brackley	41/46 [A]	-	-	Day: haul route movements - on site.	NA	4	R	T	-	-	-	-	-	
276694	Mixbury, Brackley	45/53 [A]	-	-	Day: haul route movements - on site.	NA	1	R	T	-	-	-	-	-	
276761	Fulwell Lane, Mixbury	<40/46 [A]	-	-	Day: haul route movements - on site.	NA	5	R	T	-	-	-	-	-	
276781	Mixbury, Brackley	48/55 [A]	-	-	Day: haul route movements - on site.	NA	2	R	T	-	-	-	-	-	
276837	Mixbury, Brackley	45/52 [A]	-	-	Day: haul route movements - on site.	NA	1	R	T	-	-	-	-	-	
276848	Mixbury, Brackley	42/51 [A]	-	-	Day: haul route movements - on site.	NA	3	R	T	-	-	-	-	-	
276941	Newton Purcell, Buckingham	48/53 [A]	-	-	Day: haul route movements - on site.	NA	1	R	T	-	-	-	-	-	
276979	Unnamed Road, Newton Purcell With Shelswell	47/54 [>C]	-	-	Day: haul route movements - on site.	NA	1	R	T	H	-	-	-	-	

Assessment location		Impact criteria				Significance criteria									
ID	Area represented	Typical/highest monthly outdoor L_{pAeq} [dB] at the façade			Construction activity resulting in highest forecast noise levels	Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Impact duration [months]	Mitigation effect	Significant effect
		Day 0700-1900	Evening 1900-2300	Night 2300-0700											
276994	Unnamed Road, Newton Purcell With Shelswell	<40/47 [A]	-	-	Day: haul route movements - on site.	NA	1	R	T	-	-	-	-	-	
277041	Newton Purcell, Buckingham	<40/49 [B]	-	-	Day: haul route movements - on site.	NA	5	R	T	H	-	-	-	-	
277059	Newton Purcell, Buckingham	40/49 [B]	-	-	Day: haul route movements - on site.	NA	5	R	T	H	-	-	-	-	
277073	Newton Purcell, Buckingham	43/51 [C]	-	-	Day: haul route movements - on site.	NA	2	R	T	H	-	-	-	-	
277167	Newton Purcell, Buckingham	42/48 [A]	-	-	Day: Newton Purcell underbridge (culvert) - substructure construction.	NA	4	R	T	-	-	-	-	-	
277188	Newton Purcell, Buckingham	46/52 [A]	-	-	Day: haul route movements - on site.	NA	3	R	T	-	-	-	-	-	
277221	Newton Purcell, Buckingham	49/57 [A]	-	-	Day: haul route movements - on site.	NA	3	R	T	-	-	-	-	-	
277239	Newton Purcell, Buckingham	49/57 [A]	-	-	Day: haul route movements - on site.	NA	4	R	T	-	-	-	-	-	
277261	Newton Purcell, Buckingham	58/64 [C]	-	-	Day: A4421 - Newton Purcell overbridge - substructure construction.	NA	2	R	T	H	-	-	-	-	

Assessment location		Impact criteria				Significance criteria									
ID	Area represented	Typical/highest monthly outdoor L_{pAeq} [dB] at the façade			Construction activity resulting in highest forecast noise levels	Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Impact duration [months]	Mitigation effect	Significant effect
		Day 0700-1900	Evening 1900-2300	Night 2300-0700											
277315	Banbury Road, Finmere	51/60 [A]	-	-	Day: haul route movements - on site.	NA	1	R	T	-	-	-	-	-	
277403	Banbury Road, Finmere	51/58 [A]	-	-	Day: haul route movements - on site.	NA	9	R	T	-	-	-	-	-	
277496	Banbury Road, Finmere	55/66 [A]	-	-	Day: haul route movements - on site.	A	1	R	T	-	-	Y	D 3	-	~
277548	Fulwell, Brackley	44/51 [A]	-	-	Day: haul route movements - on site.	NA	2	R	T	-	-	-	-	-	
277630	Fulwell, Brackley	42/48 [A]	-	-	Day: haul route movements - on site.	NA	4	R	T	-	-	-	-	-	
277959	Newton Purcell, Buckingham	46/54 [A]	-	-	Day: haul route movements - on site.	NA	1	R	T	-	-	-	-	-	
278675	Banbury Road, Finmere	42/51 [>C]	-	-	Day: haul route movements - on site.	NA	2	R	T	H	-	-	-	-	
278708	A421, Finmere	45/53 [A]	-	-	Day: haul route movements - on site.	NA	1	R	T	-	-	-	-	-	
279188	Banbury Road, Finmere	<40/48 [A]	-	-	Day: haul route movements - on site.	NA	1	R	T	-	-	-	-	-	
279198	Banbury Road,	44/53	-	-	Day: haul route movements - on site.	NA	1	R	T	-	-	-	-	-	

Assessment location		Impact criteria				Significance criteria									
ID	Area represented	Typical/highest monthly outdoor L_{pAeq} [dB] at the façade			Construction activity resulting in highest forecast noise levels	Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Impact duration [months]	Mitigation effect	Significant effect
		Day 0700-1900	Evening 1900-2300	Night 2300-0700											
	Finmere	[A]													
279895	Turweston, Brackley	53/58 [A]	-	-	Day: haul route movements - on site.	NA	2	R	T	-	-	-	-	-	
280457	Turweston, Brackley	47/54 [A]	-	-	Day: haul route movements - on site.	NA	1	R	T	-	-	-	-	-	
280564	Main Street, Turweston	43/53 [A]	-	-	Day: Turweston cutting - cutting excavation.	NA	5	R	T	-	-	-	-	-	
280584	Turweston, Brackley	46/57 [A]	-	-	Day: Turweston cutting - cutting excavation.	NA	2	R	T	-	-	-	-	-	
280717	Unnamed Road, Turweston	44/53 [A]	-	-	Day: haul route movements - on site.	NA	2	R	T	-	-	-	-	-	
280726	Turweston, Brackley	<40/50 [A]	-	-	Day: haul route movements - on site.	NA	4	R	T	-	-	-	-	-	
280734	The Green, Turweston	44/54 [A]	-	-	Day: haul route movements - on site.	NA	4	R	T	-	-	-	-	-	
280761	Turweston, Brackley	50/60 [A]	-	-	Day: Turweston cutting - cutting excavation.	NA	3	R	T	-	-	-	-	-	
280811	Main Street, Turweston	<40/48 [A]	-	-	Day: haul route movements - on site.	NA	4	R	T	-	-	-	-	-	

Assessment location		Impact criteria				Significance criteria									
ID	Area represented	Typical/highest monthly outdoor L_{pAeq} [dB] at the façade			Construction activity resulting in highest forecast noise levels	Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Impact duration [months]	Mitigation effect	Significant effect
		Day 0700-1900	Evening 1900-2300	Night 2300-0700											
280902	Turweston, Brackley	46/51 [A]	-	-	Day: haul route movements - on site.	NA	16	R	T	-	-	-	-	-	
280949	Turweston, Brackley	49/56 [A]	-	-	Day: Turweston cutting - cutting excavation.	NA	2	R	T	-	-	-	-	-	
281018	Turweston, Brackley	48/57 [A]	-	-	Day: Turweston cutting - cutting excavation.	NA	4	R	T	-	-	-	-	-	
281078	Turweston, Brackley	46/57 [A]	-	-	Day: haul route movements - on site.	NA	4	R	T	-	-	-	-	-	
281109	Turweston, Brackley	46/56 [A]	-	-	Day: Turweston cutting - cutting excavation.	NA	1	R	T	-	-	-	-	-	
281175	Turweston, Brackley	50/58 [A]	-	-	Day: haul route movements - on site.	NA	1	R	T	-	-	-	-	-	
281733	Mill Lane, Westbury	46/51 [A]	-	-	Day: haul route movements - on site.	NA	51	R	T	-	-	-	-	-	
281804	Brackley Road, Westbury	47/52 [A]	-	-	Day: haul route movements - on site.	NA	5	R	T	-	-	-	-	-	
281858	Westbury, Brackley	45/49 [A]	-	-	Day: haul route movements - on site.	NA	1	R	T	-	-	-	-	-	
281938	Turweston,	45/54	-	-	Day: haul route movements - on site.	NA	1	R	T	-	-	-	-	-	

Assessment location		Impact criteria				Significance criteria									
ID	Area represented	Typical/highest monthly outdoor L_{pAeq} [dB] at the façade			Construction activity resulting in highest forecast noise levels	Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Impact duration [months]	Mitigation effect	Significant effect
		Day 0700-1900	Evening 1900-2300	Night 2300-0700											
	Brackley	[A]													
282022	Turweston, Brackley	50/55 [A]	-	-	Day: haul route movements - on site.	NA	1	R	T	-	-	-	-	-	
282403	Mill Lane, Westbury	42/47 [A]	-	-	Day: haul route movements - on site.	NA	14	R	T	-	-	-	-	-	
282953	Orchard Place, Westbury	43/49 [A]	-	-	Day: haul route movements - on site.	NA	3	R	T	-	-	-	-	-	
283304	Brackley Road, Westbury	45/51 [A]	-	-	Day: haul route movements - on site.	NA	11	R	T	-	-	-	-	-	
700432	Turweston Road, Brackley	45/50 [A]	-	-	Day: haul route movements - on site.	NA	2	R	T	H	-	-	-	-	
700433	The Avenue, Whitfield	52/57 [A]	<40/<40 [C]	-	Day: haul road movements - to and from road.	NA	3	R	T	H	-	-	-	-	
700474	Turweston, Brackley	45/51 [A]	-	-	Day: haul route movements - on site.	NA	1	R	T	-	-	-	-	-	
720301	Northampton Road, Brackley	49/53 [A]	<40/<40 [B]	-	Day: A43 Northampton Road overbridge - site preparation works.	NA	1	R	T	H	-	-	-	-	

Table 3: Assessment of construction noise at non-residential receptors

Assessment location		Impact criteria				Significance criteria									
ID	Area represented	Typical/highest monthly outdoor L_{pAeq} [dB] at the façade			Construction activity resulting in highest forecast noise levels	Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Impact duration [months]	Mitigation effect	Significant effect
		Day 0700-1900	Evening 1900-2300	Night 2300-0700											
268683	Chapel Lane, Turweston	44/50	-	-	Day: Turweston cutting - cutting excavation.	B	1	G3	T	-	-	-	-	-	
273483	Unnamed Road, Radstone	49/58	45/47	-	Day: Radstone Road overbridge and footpath AX7 diversion – superstructure construction; and Evening: Brackley culvert - drainage and culvert works.	B	1	G3	T	-	-	-	D 15	-	CSV14-No1
276541	Church Lane, Mixbury	43/49	-	-	Day: haul route movements - on site.	B	1	G3	T	-	-	-	-	-	
276941	Newton Purcell, Buckingham	48/53	-	-	Day: haul route movements - on site.	B	2	G4	T	-	-	-	D 2	-	*
276994	Unnamed Road, Newton Purcell With Shelswell	<40/47	-	-	Day: haul route movements - on site.	B	1	G3	T	-	-	-	-	-	
277206	A4421, Newton Purcell	59/65	-	-	Day: haul route movements - on site.	B	1	G5	T	H	-	-	-	-	
277272	A4421, Newton Purcell With Shelswell	52/59	-	-	Day: haul route movements - on site.	B	1	G5	T	-	-	-	-	-	
280564	Main Street,	43/53	-	-	Day: Turweston cutting - cutting excavation.	B	1	G5	T	-	-	-	-	-	

Assessment location		Impact criteria				Significance criteria									
ID	Area represented	Typical/highest monthly outdoor L_{pAeq} [dB] at the façade			Construction activity resulting in highest forecast noise levels	Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Impact duration [months]	Mitigation effect	Significant effect
		Day 0700-1900	Evening 1900-2300	Night 2300-0700											
	Turweston														
280717	Unnamed Road, Turweston	44/53	-	-	Day: haul route movements - on site.	B	1	G3	T	-	-	-	D 0	-	CSV14-No2
280811	Main Street, Turweston	<40/48	-	-	Day: haul route movements - on site.	B	1	G3	T	-	-	-	-	-	
281733	Mill Lane, Westbury	46/51	-	-	Day: haul route movements - on site.	B	2	G5	T	-	-	-	-	-	
282403	Mill Lane, Westbury	42/47	-	-	Day: haul route movements - on site.	B	1	G4	T	-	-	-	-	-	
282403	Mill Lane, Westbury	42/47	-	-	Day: haul route movements - on site.	B	5	G5	T	-	-	-	-	-	
282953	Orchard Place, Westbury	43/49	-	-	Day: haul route movements - on site.	B	1	G3	T	-	-	-	-	-	
700432	Turweston Road, Brackley	45/50	-	-	Day: haul route movements - on site.	B	1	G5	T	H	-	-	-	-	

Airborne sound: indirect effects

4.3.9 Construction road traffic associated with the construction phases of the Proposed Scheme will generate airborne noise. The change in traffic noise level at a reference distance of 10m from the edge of the nearside carriageway resulting from the presence of construction traffic for a given road has been predicted, based upon traffic information for the Proposed Scheme. The results for the roads where potentially significant effects could arise are presented in Table 4.

4.3.10 Explanation of the information within Table 4 is provided in Volume 5: Appendix SV-001-000, with the following additional notes:

Where the significant effect column is highlighted a significant effect is identified on nearby communities or individual receptors

Change values

Yellow denotes a minor impact – a change of between 3 and 5dB or between 1 and 3dB where a high existing sound level is identified

Orange denotes a moderate impact – a change of between 5 and 10dB or between 3 and 5dB where a high existing sound level is identified

Red denotes a major impact – a change of more than 10 dB or more than 5dB where a high existing sound level is identified

Table 4: Assessment of construction traffic noise levels

Road name	Link	Future baseline sound level (dB)	Future baseline sound level + construction traffic (dB)	Change (dB)	Significant effect
		Daytime $L_{pAeq,16hr}$ 0700-23:00 free-field	Daytime $L_{pAeq,16hr}$ 0700-2300 free-field		
A422 Brackley Road	Westbury	66.4	70.0	+3.6	

4.4 Assessment of significant effects

Residential receptors: direct effects – individual dwellings

4.4.1 Taking account of the avoidance and mitigation measures set out in the previous paragraphs, no residential buildings are forecast to experience noise levels higher than the noise insulation trigger levels as defined in the draft CoCP. For daytime construction the trigger level is an equivalent continuous noise level of 75dB[2].

4.4.2 The mitigation measures, including noise insulation, will reduce noise inside all dwellings such that it does not reach a level where it would significantly affect[1] residents.

Residential receptors: direct effects – communities

4.4.3 The avoidance and mitigation measures in this area will avoid airborne construction noise adverse effects[1] on the majority of receptors and communities. Residual temporary noise or vibration effects are identified later in this section.

4.4.4 With regard to noise outside dwellings, the assessment of temporary effects takes account of construction noise relative to existing sound levels.

4.4.5 In locations with lower existing sound levels[3], construction noise effects[1] are likely to be caused by changes to noise levels outside dwellings. These may be considered by the local community as an effect on the acoustic character of the area and hence be perceived as a change in the quality of life. These effects are considered to be significant when assessed on a community basis taking account of the local context[3].

4.4.6 In this area, the mitigation measures reduce the effects of outdoor construction noise on the acoustic character around the local residential communities such that the effects are considered to be not significant.

4.4.7 Detailed information regarding landscape earth works was not available at the time of the quantitative assessment. Therefore a screening assessment of the noise arising from these works on non-residential receptors has been undertaken by determining the minimum distance from the works site boundary at which the onset of a construction noise impact would be expected. In accordance with the draft CoCP these effects will be subject to review as part of the Section 61[4] application process for the construction works. The screening assessment used represents a worst case scenario. The assessment has resulted in identification of no likely significant effects on residential receptors.

Residential receptors: indirect effects

4.4.8 Significant noise effects on residential receptors arising from construction traffic are unlikely to occur in this area.

[2] $L_{pAeq,0800-1800}$ measured outdoors at the building façade.
[3] Further information is provided in Volume 5: Appendix SV-001-000.
[4] Section 61 Agreement under the Control of Pollution Act, 1974 (c.40). London, Her Majesty's Stationery Office.

4.4.9 A potentially significant increase in traffic noise levels has been identified on the A422 Brackley Road, however, no sensitive receptors have been identified in the vicinity of the route where this increase is expected and therefore a significant effect has not been identified.

Non-residential receptors: direct effects

4.4.10 Significant construction noise or vibration effects[5] have been identified on the following non-residential receptors:

- St Lawrence's Church, Radstone (CSV14-N01). Significant noise effects have been identified on a reasonably foreseeable worst case basis due to daytime construction noise associated with the Radstone Road overbridge and footpath diversions works. The reasonable worst case forecast noise levels at the church are 57dB for a period of approximately one year and two months in 2018.
- Proposed 4 room bed and breakfast development at Hall Farm, Radstone (CSV14-N02). Significant noise effects have been identified on a reasonably foreseeable worst case basis due to daytime construction activities associated with nearby landscape mitigation earthworks.

4.4.11 A noise impact has been identified at the Old Rectory Surgery and Dental Surgery in Newton Purcell, represented by Assessment Location 276941. This impact is based on the noise levels at the worst affected floor, i.e. second floor. The buildings do not appear to be sensitive above the first floor and review of the noise model indicates that the predicted noise levels at lower floors would reduce to a point where a significant effect would not be expected.

4.4.12 Detailed information regarding landscape earth works was not available at the time of the quantitative assessment. Therefore a screening assessment of the noise arising from these works on non-residential receptors has been undertaken by determining the minimum distance from the works site boundary at which the onset of a construction noise impact would be expected. In accordance with the draft CoCP these effects will be subject to review as part of the Section 61[4] application process for the construction works. The screening assessment used represents a worst case scenario. The assessment has resulted in identification of no likely significant effects on non-residential receptors.

Non-residential receptors: indirect effects

4.4.13 Significant noise effects on non-residential receptors arising from construction traffic are unlikely to occur in this area.

4.4.14 No sensitive non-residential receptors have been identified in the vicinity of the A422 Brackley Road where increased traffic noise levels are expected. Therefore no significant indirect traffic effects are expected.

[5] Activity disturbance, especially for activities that require good conditions for verbal communication

Cumulative effects from the Proposed Scheme and other committed development

4.4.15 This assessment has considered the potential cumulative construction noise effects of the Proposed Scheme and other committed developments[6]. In this area, there are a number of developments that may be built at the same time as the Proposed Scheme; however, based on the proximity of the Proposed Scheme and any noise sensitive receptors construction noise or vibration from the Proposed Scheme is unlikely to result in any significant cumulative noise effects.

[6] Refer to Volume 5: Appendix CT-004-000

5 References

Control of Pollution Act 1974 (c.40). London, Her Majesty's Stationery Office.